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**UNDERERNÆRING**

Stratton RG, C.J.; Elia, M. Disease-related malnutrition: An Evidence-Based Approach To Treatment CABI publishing; 2003.

**DEFINISJONER OG KRITERIER**


Soeters P, Bozzetti F, Cynober L, Forbes A, Shenkin A, Sobotka L. 
Defining malnutrition: A plea to rethink. 

PREVALENS (ERNÆRINGSRISIKO OG/ELLER UNDERERNÆRING)

Martins CP, Correia JR, do Amaral TF. 

Singh H, Watt K, Veitch R, Cantor M, Duerksen DR. 

Bauer JD, Isenring E, Torma J, Horsley P, Martineau J. 


Tangvik RJ, Guttormsen AB, Tell GS, Ranhoff AH. 

Tangvik RJ, Tell GS, Guttormsen AB, Eisman JA, Henriksen A, Nilsen RM, Ranhoff AH: 

Eide HK, Benth JS, Sortland K, Halvorsen K, Almendingen K. 
Jacobsen EL, Brovold T, Bergland A, Bye A. 
**Prevalence of factors associated with malnutrition among acute geriatric patients in Norway: a cross-sectional study.** BMJ Open 2016;6:e011512. doi:10.1136/bmjopen-2016-011512

**KONSEKVENSER AV ERNÆRINGSMESSIG RISIKO OG UNDERERNÆRING**

*Sarcopenia is predictive of nosocomial infection in care of the elderly.* The British journal of nutrition. 2006;96(5):895-901.

Mowe M, Diep L, Bohmer T.
**Greater seven-year survival in very aged patients with body mass index between 24 and 26 kg/m2.** Journal of the American Geriatrics Society. 2008;56(2):359-60.

Juliebo V, Bjoro K, Krogseth M, Skovlund E, Ranhoff AH, Wyller TB. 

**Societal consequences of falls in the older population: injuries, healthcare costs, and long-term reduced quality of life.** J Trauma. 2011 Sep.; 71(3):748-53.

Barker LA, Gout BS, Crowe TC.

Lieffers JR, Bathe OF, Fassbender K, Winget M, Baracos VE. 


Agarwal E1, Ferguson M, Banks M, Batterham M, Bauer J, Capra S, Isenring E. 
**Malnutrition and poor food intake are associated with prolonged hospital stay, frequent readmissions, and greater in-hospital mortality: results from the Nutrition Care Day Survey 2010.** Clin Nutr. 2013 Oct;32(5):737-45

Tangvik RJ, Tell GS, Eisman JA, et al.


SCREENING


SCREENING OG KARTLEGGINGSVERKTØY (MED LENKER TIL HVOR DE FINNES)

MNA (SF)

Mini Nutritional Assessment er et kartleggingsverktøy som fører til vurderingene «Normal ernæringsstatus», «Risiko for underernæring» eller «Underernært».

Lenk til norsk oversettelse av MNA
http://www.mna-elderly.com/forms/MNA_norwegian.pdf

Veiledning for utfylling av MNA skjema for ernæringsvurdering
http://www.mna-elderly.com/forms/mna_guide_norwegian.pdf

Veiledningen har følgende vedlegg:
Vedlegg 1 • Tabell over Kroppsmasseindeks
Vedlegg 2 • Regne ut BMI for personer med amputasjon
Vedlegg 3 • Måle høyde ved hjelp av et Stadiometer
Vedlegg 4 • Måle Pemispan
Vedlegg 5 • Måle Knehøyde
Vedlegg 6 • Måle Overarmens Omkrets (OO)
Vedlegg 7 • Måle Leggens Omkrets
17 referanser

Mastronuzzi T, Paci C, Portincasa P, Montanaro N, Grattagliano I.

**MUST**

Malnutrition Universal Screenings Tool er et verktøy som vurderer risikoen for underernæring og skårer pasientene i «Lav risiko», «Middels risiko» eller «Høy risiko» for underernæring.

Lenk til norsk oversettelse av MUST

Lenk til veiledning for utfylling av MUST
13 referanser

**NRS-2002**
Nutrition Risk screening 2002

Kondrup J, Rasmussen HH, Hamberg O et al

J. Kondrup, S. P. Allison, M. Elia, B. Vellas, M. Plauth

Sorensen J, Kondrup J, Prokopowicz J, et al

Tevik K, Thürmer H, Husby MI, de Soysa AK, Helvik AS.
**Nutritional risk screening in hospitalized patients with heart failure.** Clin Nutr. 2015 Apr;34(2):257-64

**Norsk oversettelse**
6.utgave, desember 2015 er rett oversettelse fra original publikasjon.
http://www.fresenius-kabi.no/Documents/Open%20files/NO/EN/God_ern%C3%A6ringspraksis_lommebrosjyre.pdf
Kompetansetjenesten for sykdomsrelatert underernæring (september 2017)

PG-SGA
The Scored Patient-Generated Subjective Global Assessment

Det er mange versjoner av SGA oversatt til ulike språk. PG-SGA inneholder elementene i screeningsverktøy og kan derfor fungere både som screening og kartleggingsverktøy. PG-SGA setter i dag standarden og er det foretrukne verktøyet innen onkologi og ved andre kronisk katabolske tilstander. PG-SGA er et kartleggingsverktøy som gir tilstandene velernært, moderat underernært eller alvorlig underernært.

**Norsk oversettelse**
Vil komme på nettsiden til Pt-Global
http://pt-global.org/?page_id=13

SNAQ

Short Nutritional Assessment Questionnaire (SNAQ) er ikke oversatt til norsk. Det finnes flere varianter av SNAQ for bruk på ulike nivåer av helsetjenestene og for ulike aldersgrupper.

Lenk til SNAQ verktøyene

**EFFEKT AV SCREENING**

Omidvari AH, Vali Y, Murray SM, Wonderling D, Rashidian A.

**DOES NUTRITION SUPPORT HELP THOSE SCREENED POSITIVE?**

Starke J, Schneider H, Alteheld B, Stehle P, Meier R.


Sriram K, Sulo S, VanDerBosch G, Feldstein JPJ, Hegazi RA, Summerfelt WmT,

**EFFEKT AV ERNÆRINGSINTERVENSJONER**

Stratton RG, C.J.; Elia, M. *Disease-related malnutrition: An Evidence-Based Approach To Treatment* CABI publishing; 2003.

**Evidence for nutrition support**

- Meta-analysis of 27 RCT with 1710 patients (complications)
- 30 RCT with 3250 patients (mortality)
- Complications: 28% vs 46% (P<0.001)
- Mortality: 17% vs 24% (P<0.001)


Isenring EA, Capra S, Bauer JD. *Nutrition intervention is beneficial in oncology outpatients receiving radiotherapy to the gastrointestinal or head and neck area.* Br J Cancer. 2004;91(3):447-452.

Isenring E, Capra S, Bauer J. *Patient satisfaction is rated higher by radiation oncology outpatients receiving nutrition intervention compared with usual care.* J Hum Nutr Diet. 2004;17:145-152.

Odelli C, Burgess D, Bateman L, et al.

Persson C, Glimelius B, Rönnelid J, Nygren P.

Ravasco P, Monteiro-Grillo I, Marques Vidal P, Camilo ME.

Ravasco P, Monteiro-Grillo I, Vidal PM, Camilo ME.

Bauer J, Capra S, Battistutta D, Davidson W, Ash S.

de Luis DA, Izaola O, Aller R, Cuellar L, Terroba MC.

Duncan DG, Beck SJ, Hood K, Johansen A.

Fearon KC, Barber MD, Moses AG, et al.

Isenring EA, Bauer JD, Capra S.

Guarcello M, Riso S, Buosi R, d’Andrea F.

Read J, Beale P, Volker D, Smith N, Childs A, Clarke S.

de Luis DA, Izaola O, Aller R, Cuellar L, Terroba MC, Martin T.

Ryan AM, Reynolds JV, Healy L, et al.

Ha L, Hauge T, Spenning AB, Iversen PO.


van den Berg MGA, Rasmussen-Conrad EL, Wei KH, et al

Taylor LA, Pletschen L, Arends J, Unger C, Massing U.

van der Meij BS, Langius JAE, Smit EF, et al.

Somanchi M1, Tao X, Mullin GE.

Murphy RA, Mourtzakis M, Chu QS, Baracos VE, Reiman T, Mazurak VC.

Glare P, Jongs W, Zafiropoulos B.

Weed HG, Ferguson ML, Gaff RL, Hustead DS, Nelson JL, Voss AC.
**Fish oil supplement alters markers of inflammatory and nutritional status in colorectal cancer patients.** Nutr Cancer. 2012;64(2):267-273.

Holyday M, Daniells S, Bare M, Caplan GA, Petocz P, Bolin T.  


Bonatto SR, Oliveira HP, Nunes E, et al.  

Beck A, Andersen UT, Leedo E et al  
**Does adding a dietician to the liaison team after discharge of geriatric patients improve nutritional outcome: A randomized controlled trial.** Clin Rehabil, 2014;29:1117-28

Deutz NE, Matheson EM, Matarese LE, et al  

**IMPLEMENTERING AV ERNÆRINGSSTRATEGIER/-PROGRAM**

Guenter P, Jensen G, Paten V et al  
**Addressing Disease-Related Malnutrition in Hospitalized Patients: A call for a National Goal** The Joint Commission Journal on Quality and Patient Safety, 2015; 41:469-473

Brugler L, DiPrinzio MJ, Bernstein L.  

**BARRIERER OG SUKSESSFAKTORER**

Food and nutritional care in hospitals: How to prevent undernutrition.  
Strasbourg: Council of Europe Publishing; 2002

Cahill NE, Suurdt J, Ouellette-Kuntz H, Heyland DK.  

Holst M, Rasmussen HH.
Juul HJ, Frich JC.

Stamp N, Davis AM
Identifying barriers to implementing nutrition recommendation Topics in Clin Nutr, 2013; 28:249-261

Leistra, E., van Bokhorst-de van der Schueren, M. A., et al

Ekramzadeh M, Mazloom Z, Jafari P, Ayatollahi M, Sagheb MM.
Major barriers responsible for malnutrition in hemodialysis patients: challenges to optimal nutrition.

Eide HD, Halvorsen K, Almendingen K.

Keller H, Allard J, Vesnauer E, et al

van Nie-Visser, N. C., Meijers, J. M., Schols, et al
To what extent do structural quality indicators of (nutritional) care influence malnutrition prevalence in nursing homes? Clin Nutr 2015;34:1172-1176

C.L. Funk, C.M. Ayton
Improving malnutrition documentation enhances reimbursement J Am Diet Assoc,1995;95,468–475

The economic impact of disease-related malnutrition at hospital admission
Clin Nutr, 2007;26:778–784

Karen Freijer’s avhandling Nutrition Economics Disease related malnutrition & the
economic health care value of medical nutrition kan lastes ned fra denne lenken
http://digitalarchive.maastrichtuniversity.nl/fedora/get/guid:5a5c4ad5-9836-41b3-b86e-40067eb44e73/ASSET1

Freijer K, Nuijten MJ.
Analysis of the health economic impact of medical nutrition in the Netherlands.

Health economic impact of managing patients following a community-based diagnosis of

Norman, K., Pirlich, M., Smoliner, C., Kilbert, A., Schulzke, J. D., Ockenga, J., Lochs, H.
Reinhold, T. Cost-effectiveness of a 3-month intervention with oral nutritional
supplements in disease-related malnutrition: a randomised controlled pilot study
Eur J Clin Nutr, 2011;65: 735-42

Freijer K, Nuijten MJ, Schols JM.
The budget impact of oral nutritional supplements for disease related malnutrition in
elderly in the community setting Front Pharmacol 2012; 3; 78: 1-8

Lim, S.L., Ong, K.C., Chan, Y.H., Loke, W.C., Ferguson, M., Daniels, L.

Estimating the costs associated with malnutrition in Dutch nursing homes. Clinical
Nutrition 2012;31,65-68.

Jie B1, Jiang ZM, Nolan MT, Zhu SN, Yu K, Kondrup J
Impact of preoperative nutritional support on clinical outcome in abdominal surgical

Freijer K, Tan SS, Koopmanschap MA, Meijers JM, Halfens RJ, Nuijten MJ.

The economic value of enteral medical nutrition in the management of disease-related

Freijer K, Lenoir-Wijnkoop I, Russell CA, et al
The view of European experts regarding health economics for medical nutrition in
Souzaa TT, Sturiona CJ, Faintuchb J.

Elia M, Normand C, Norman K, Laviano A.

ESPEN GUIDELINES

Alle kan lastes ned fra http://www.espen.org/education/espen-guidelines

ESPEN guideline: Clinical nutrition in surgery Clinical Nutrition 36 (2017) 623-650

ESPEN guideline: Clinical nutrition in inflammatory bowel disease Clinical Nutrition 36 (2017) 321-347

ESPEN guidelines on definitions and terminology of clinical nutrition Clinical Nutrition 36 (2017) 149-64

ESPEN guidelines on nutrition in cancer patients Clinical Nutrition 36 (2017) 11–48

Management of acute intestinal failure: A position paper from the European Society for Clinical Nutrition and Metabolism (ESPEN) Special Interest Group Clinical Nutrition 35 (2016), 6, 1209–1218


ESPEN guideline on ethical aspects of artificial nutrition and hydration Clinical Nutrition 35 (2016) 545-556


ESPEN endorsed recommendations: Protein intake and exercise for optimal muscle function with aging: Recommendations from the ESPEN Expert Group Clinical Nutrition 33 (2014) 929-936


ESPEN Guidelines for adult parenteral nutrition Clinical Nutrition 2009; 28:359-479

ESPEN Guidelines on adult enteral nutrition Clinical Nutrition 2006;25:177-360

ESPEN Guidelines on enteral nutrition — Percutaneous endoscopic gastrostomy (PEG) Clinical Nutrition 2005;24:848-861


ESPEN Guidelines for nutrition in liver disease and transplantation Clinical Nutrition 1997;16:43-55

DEMENS

Nutrition and dementia. A review of available research.
https://www.alz.co.uk/sites/default/files/pdfs/nutrition-and-dementia.pdf


PULIKASJONER FRA NUTRITION DAY DATA


Navarro DA, Boaz M, Krause I, et al Improved meal presentation increases food intake and decreases readmission rate in hospitalized patients Clin Nutr (2016); 35:1153-1158
Streicher M, Themessl-Huber M, Schindler k, Sieber CC, Hiesmayr M, Volkert D. 


Frantal S, Pernicka E, Hiesmayr M, Schindler K, Bauer P. **Length bias correction in one-day cross-sectional assessments – The nutritionDay study.** Clin Nutr (2016); 35:522-527


Kristin Halvorsen, Helene Kjøllesdal Eide, Kjersti Sortland and Kari Almendingen

Documentation and communication of nutritional care for elderly hospitalized patients: perspectives of nurses and undergraduate nurses in hospitals and nursing homes BMC Nursing (2016) 15:70
Since there is no single parameter that is definitive for adult malnutrition, identification of two or more of the following six characteristics is recommended for diagnosis (see the Table):

- insufficient energy intake (30-32);
- weight loss (33-36);
- loss of muscle mass (36,37);
- loss of subcutaneous fat (36,37);
- localized or generalized fluid accumulation (36,37) that may sometimes mask weight loss; and
- diminished functional status as measured by hand grip strength (3,36,38-42).
Table. Academy of Nutrition and Dietetics (Academy)/American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) clinical characteristics that the clinician can obtain and document to support a diagnosis of malnutrition<sup>26</sup> (continued)

<table>
<thead>
<tr>
<th>Clinical characteristic</th>
<th>Malnutrition in the Context of Acute Illness or Injury</th>
<th>Malnutrition in the Context of Chronic Illness</th>
<th>Malnutrition in the Context of Social or Environmental Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-severe (moderate) malnutrition</td>
<td>Severe malnutrition</td>
<td>Non-severe (moderate) malnutrition</td>
</tr>
<tr>
<td>(4) Muscle mass</td>
<td>Mild</td>
<td>Moderate</td>
<td>Mild</td>
</tr>
<tr>
<td>Muscle loss (eg, wasting of the temples [temporalis muscle], clavicles [pectoralis and deltoids], shoulders [deltoids], intercostal muscles, scapula [latissimus dorsi, trapezius, deltoids, thoracic (quadratus) and calf [gastrocnemius])</td>
<td>Mild</td>
<td>Moderate to severe</td>
<td>Mild</td>
</tr>
<tr>
<td>Fluid accumulation</td>
<td>Mild</td>
<td>Measurably reduced</td>
<td>N/A</td>
</tr>
<tr>
<td>The clinician may evaluate generalized or localized fluid accumulation evident on exam (distension, vulvar/sural edema or acanthosis). Weight loss is often masked by generalized fluid retention (edema and weight gain may be observed)</td>
<td>N/A</td>
<td>Measurably reduced</td>
<td>N/A</td>
</tr>
<tr>
<td>Reduced grip strength (reference 42)</td>
<td>Consult normative standards supplied by the manufacturer of the measurement device.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fact box:
Two alternative ways to diagnose malnutrition.
Before diagnosis of malnutrition is considered it is mandatory to fulfil criteria for being “at risk” of malnutrition by any validated risk screening tool.

**Alternative 1:**
BMI <18.5 kg/m²

**Alternative 2:**
Weight loss (unintentional) > 10% indefinite of time, or >5% over the last 3 months combined with either
BMI <20 kg/m² if <70 years of age, or <22 kg/m² if 70 years of age or
FFMI <15 and 17 kg/m² in women and men, respectively.

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**Cederholm et al 2015**

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**Cederholm et al 2017**